

**ABSTRACT**

A heat exchanger for use with an electronic heat pump including a plurality of narrow channels defined between adjacent walls. The channel heights are between 0mm and 10mm to ensure thermal resistance is below  $0.1^{\circ}\text{C}/\text{W}$  for a 40mm heat exchange width. The acceptable geometry for the channels is described by one or more variables, including the minimum number of channels and the minimum wall thickness for a given channel width. These variables control the surface area of the boundary of the channels in direct contact with the fluid and the cross-sectional area available for transmission of heat by conduction up the walls of the channels.